



PREVENTION OF STHAULYA (OBESITY) W.S.R. TO USE OF SHREE ANNA (NUTRACEREALS)- MILLETS

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ABSTRACT:

Obesity is a complex, chronic disorder characterised by excessive accumulation of visceral & subcutaneous fat, due to influence of genetic, hormonal, and behavioural factors on body. Being a leading cause of majority of complications like breathing disorders including sleep apnoea, Stroke, Carcinomas, Metabolic syndrome & infertility to name a few, making it altogether a serious health concern. In accordance with the WHO's integrative management for obesity, Ayurveda offers a holistic approach in management of obesity which comprises change in dietary regimen (making choice of healthier foods like millets – “shree anna”) along with lifestyle modifications, thereby preventing obesity and its complications.

Key words: Obesity, *Sthaulya*, Millets, Shree anna.

INTRODUCTION:

Obesity, a common disorder in recent times is defined by ICD-11 (International Classification of Diseases-11) as “a chronic complex disease defined by excessive adiposity that can impair health. It is in most cases a multifactorial disease due to obesogenic environments, psychosocial factors, and genetic variants.” Body Mass Index (BMI) is a marker of adiposity, based on weight & height parameters and defined as body mass (in kilograms) divided by square of the body height (in metres) and expressed as kg/m². The BMI categories for defining overweight varies according to age & gender in infants, children & adolescents. For adults, WHO defines overweight as BMI greater than or equal to 25 and obesity as BMI greater than or equal to 30^[1]. In *Ayurveda*, the obesity (*Sthaulya*) is characterised by features like excessive increase in *mamsa* (muscle mass) & *meda dhatu* (adipose tissue) at hip, abdomen & chest regions, leading to their motion while walking, accompanied with reduced body metabolism and decreased enthusiasm^[2]. The common health consequences related to obesity are cardiovascular diseases (Hypertension, heart disease & stroke), musculoskeletal disorders (osteoarthritis), and some carcinomas (including breast, liver, gall bladder & colon), making it altogether a serious health concern. In accordance with the

WHO's integrative management for obesity, *Ayurveda* offers a holistic approach in management of obesity which comprises change in dietary regimen (making choice of healthier foods like millets – “*shree anna*”) along with lifestyle modifications, thereby preventing obesity.

MATERIALS & METHODS:

Literary review of *Sthaulya* from ayurvedic classical texts like *Charaka Samhita*, *Sushruta Samhita*, *Bhavaprakasha Nighantu* along with its modern correlation from the relevant textbooks, peer-reviewed articles, and relevant websites.

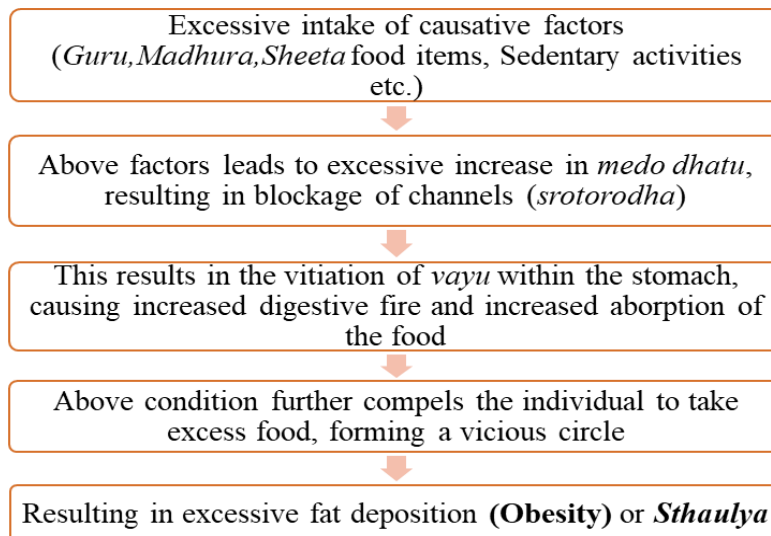
Observations:

Causes – The main ground for obesity is the energy disparity among calories consumed and calories expenditure. Modern theories suggests that aetiology of obesity is multifactorial as genetic, environmental as well as behavioural factors contribute to the development of obesity. According to *ayurvedic* texts following causes promotes obesity^[3] -

- i. Over-eating.
- ii. Excessive intake of *Guru*, *Madhura*, *Sheeta*, *Snighdha* food items.
- iii. Avoiding exercise routine.
- iv. Abstaining from sex acts.
- v. Daytime sleeping.
- vi. Always in happy mood.
- vii. Averting stress, anxiety etc. mental issues.

viii. Hereditary/Genetic factors.

Pathophysiology of *Sthauilya* (Obesity) ^[4] –



Flow chart no. 1 - Pathophysiology of *Sthauilya*

Complications of *Sthauilya* ^[5] – Complications of *sthauilya* includes:

- Aging quickly.
- Showing no enthusiasm in day-to-day activities.
- Difficulty in indulging in sexual acts.
- General debility.
- Foul smell from body.
- Excessive sweating.
- Increased appetite.
- Excessive thirst.

Management of *Sthauilya* (Obesity)–

Effective management of *sthauilya* requires an integrative approach to overcome the body's resistance to the weight loss. According to *ayurvedic* texts, Diet, physical activity, and behavioural modifications remains the mainstay of the treatment, which should be having *vata*,

kapha and *meda* reducing properties ^[6], which can be described as follows:

1) Physical activity & Behavioral modifications:

It includes night awakenings, indulgence in sexual activities and performing physical as well as mental activities ^[7].

2) Diet: It includes the use of dietary items,

majority of which are millets like *priyangu*, *sanwa*, *yavaka*, *yava*, *juurnahva*, *kodo*, *munga*, *kulatha* etc ^[8]., properties of which are as follows:

A) *Priyangu* (*Setaria italica* L.) – It is also known as Foxtail/Italian millet. It is available in four varieties viz. *krishna*, *rakta*, *peeta*, and *shweta*. It has *ruksha*, and *kapha* diminishing properties ^[9].

The aqueous extract of *S.italica* seeds have been found to exhibit hypolipidemic activities by lowering the levels of triglycerides, total

LDL & VLDL cholesterol and increasing the levels of HDL cholesterol in rats. Thus, this grain possesses excellent hypolipidemic properties which may be due to the presence of alkaloid or glycosides as active principles [10].

Whole grain extract of *S.italica* has been found to possess anti-obesity activity in in-vivo model study in rats. [11]

B) Shyamaka/Sanwa (Echinochloa frumentacea) – It is also called Barnyard millet. The other popular names are *raaj dhanya* and *shyama*. It has *shoshana* (water & *kapha* absorbing) and *ruksha* properties, therefore, it increases *vata* and pacifies *pitta* & *kapha* [12]. These grains have *kashaya* & *madhura rasa* and are *laghu* in nature [13].

Being an excellent source of dietary fibre, Barnyard millet contains ample amount of highly digestible protein and low quantity of slowly digestible carbohydrate, thus existing as boon to the people engaged in sedentary activities. Moreover, it is also helpful in reduction of blood glucose & lipid levels [14].

Short-chain fatty acids like propionate and acetate, present in the Barnyard millet, gets absorbed into the splenic circulation and transferred to liver where hepatocytes inhibit cholesterol synthesis and release glucose from liver, thereby resulting in hypocholesterolaemia and hypoglycaemic actions. [15]

Presence of good amount of fibre helps in lowering cholesterol by eliminating LDL from the body and increasing HDL cholesterol. [16]

C) Yavaka (Avena sativa Linn.) – It is commonly known as *jai* or *tokya*. It is a variety of *yava* which is inferior in quality [17].

Oats is a type of cereal grain, which is most prized for their health benefits & nutritional values. Oatmeal is considered ideal for those trying to lose weight and control hunger levels, owing to its high water and soluble fibre content. *Beta*-glucan, the primary type of soluble fibre present in oats has been found to help slow digestion, increase satiety, and suppress appetite [18].

Consumption of oats also leads to reduced total cholesterol as well as LDL cholesterol, further reducing the risk of coronary artery disease [19].

Ample amount of macronutrients, minerals, vitamins, soluble fibres, and several phytochemicals present in oats results in lowering the appetite as well as maintaining body weight & BMI. [20]

D) Yava (Hordeum vulgare L.) – Commonly known as Barley, is used to make bread along with wheat flour. It is also used in making malt & beverages. Those with high quantity of starch are preferred for manufacturing malts whereas those with high protein content are used in making bread. One of the specific

preparations of *yava* is *saktu* ^[21], which is highly used for reducing fat.

It is highly *ruksha*, *kashaya*, *madhura* in nature, reduces excessive fat in overweight individuals and prevents obesity, *vata roga* and excessive thirst ^[22].

Studies suggest that consumption of barley in comparison to wheat foods is associated with marked reduction in both the total cholesterol as well as LDL cholesterol, concluding that barley dietary fibre is more efficacious than wheat dietary fibre in lowering blood cholesterol in hypercholesterolemic men ^[23].

Barley tops in terms of containing fibre content in the whole grains. Soluble fibre like β -glucans, present in barley absorbs large amount of water and forming gels, leading to increased stomach distention along with slow gastric emptying, thereby contributing to satiety.

Diets with low glycaemic index are significant for weight loss, and barley has lowest glycaemic index among the cereal grains ^[24].

Studies have reported that barley water aids in weight loss among obese females by significantly reducing body weight and waist circumference. ^[25]

E) Joornahva (*Sorghum vulgare*) – It is known as Gram millet and popularly called as *jowar* or *juar*. In *Ayurveda*, it is known as *Yavanaal* ^[26]. It diminishes *vata* & *kapha doshas* and reduces *medo dosha* (excessive fat) ^[27].

The carbohydrate content of Sorghum constitutes of starch, soluble sugar, and fibre. Slow digestible starch (SDS), present in ample amount in the sorghum has functional property of prolonging digestion & absorption of carbohydrates in intestine. Enough dietary fibre found in sorghum, renders the role of bulking agent, binding agent of cholesterol, increases transit time and slows down carbohydrate absorption, which has a marked impact in prevention & management of diseases like constipation, irritable bowel syndrome and obesity. Lipid content of sorghum has capability to reduce the cholesterol ^[28].

Sorghum bran consumption checks the abdominal fat storage and plays a major role in lipid and glucose metabolism regulation biomarkers that are simulated by high fat diet in rats. ^[29]

F) Kodo (*Paspalum scrobiculatum* L.) – It is known as *kodrava* & *kordusha* in *ayurvedic* texts. It is having *grahi* and *shoshana* properties and aggravates *vata dosha* but pacifies both *pitta* & *kapha doshas* ^[30].

Studies suggests that by enhancing digestion and absorption, eating a high fibre diet aids in improving bowel functions and lowers the risk of obesity. Millets assist in weight control & obesity by satiating appetite centre ^[31].

Grains of *P. scrobiculatum* L. showed remarkable reduction in body weight,

triglyceride, LDL and VLDL levels in high fat diet induced hyperlipidaemia in rats. ^[32]

DISCUSSION:

The main line of treatment of *sthaulya* (obesity), according to *ayurvedic* texts is consumption of *guru ahara* along with *aptarpana* ^[33] (dietary items which helps in absorption of *sharirika dhatus*, without nourishing them), the cause being that as the obese peoples have increased digestive fire, the consumption of *guru ahara* (heavy diet) will be ideal for them and the *ruksha* nature of these items will further helps in absorption of *medo dhatu* (excessive fat). As millets contains both above properties, they are ultimate dietary option for the obese people.

CONCLUSION:

The cultivation of millets or coarse grains requires less water, less labour, minimal use of pesticides & are therefore cost effective in nature. The major factor behind decrease in consumption of millets is due to lack of awareness of their nutritional benefits, lack of processing mechanics and inconvenience in food preparation, which can be overwhelmed by creating awareness in masses regarding the nutritional merits of millets, adapting new processing technologies and promoting the various dietary options for consumption of millets such as biscuits, cookies, porridge, *idli*, *dosa*, *upma*, malt, beverages etc. Moreover, millets contain ample amount of proteins,

vitamins, and minerals in addition to health promoting phenolic acids and flavonoids ^[34], which further makes them preferred dietary food for obese peoples.

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